
Bibliography.

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(19) [Country of Issue] Japan Patent Office (JP)
(12) [Official Gazette Type] Open patent official report (A)
(11) [Publication No.] JP,2000-192298,A (P2000-192298A)
(43) [Date of Publication] July 11, Heisei 12 (2000. 7.11)
(54) [Title of the Invention] Substrate plating equipment.
(51) [The 7th edition of International Patent Classification]
C25D 17/00 .
7/12 .
H01L 21/288 .
[FI]
C25D 17/00 H .
7/12 .
H01L 21/288 E .
[Request for Examination] Un-asking.
[The number of claims] 5.
[Mode of Application] OL.
[Number of Pages] 6.
(21) [Filing Number] Japanese Patent Application No. 10-370932.
(22) [Filing Date] December 25, Heisei 10 (1998. 12.25)
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[Theme code (reference)]
4K024.
4M104.
[F term (reference)]
4K024 AA09 AB01 bus-available11 BB12 CB02 CB07 CB13 CB18 CB26 GA15.
4M104 BB04 DD52 HH20.

[Translation done.]

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Summary.

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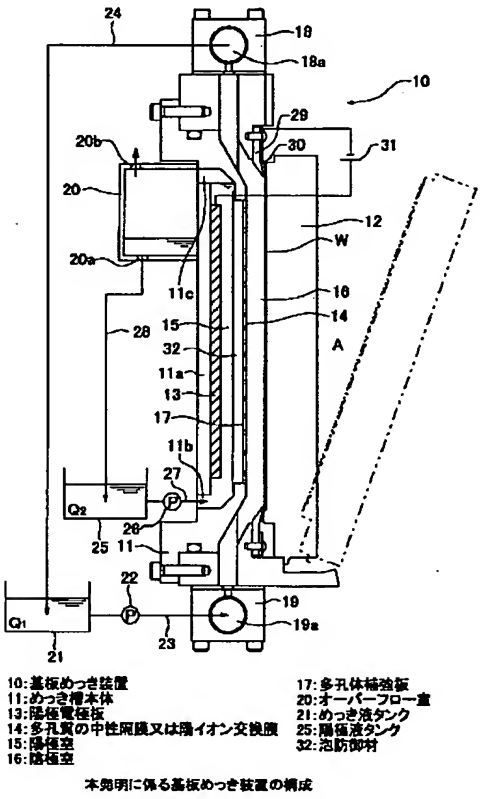
(57) [Abstract]
[Technical problem] Can remove promptly the oxygen gas which occurs on the anode plate electrode board front face which the ejection of the galvanized substrate after a plating processing end is easy, the additive in plating liquid prevents contacting and decomposing into an anode plate electrode board front face, and there is no bird clapper coarsely [a plating front face] by shortage of an additive, and serves as trouble of passage of the current at the time of electrolysis plating, and provide the substrate plating equipment which can form a uniform metal plating film.
[Means for Solution] While arranging the anode plate electrode board 13 of non-solubility, and the galvanized substrate W face to face. Arrange the diaphragm which consists of a porous neutral diaphragm or a porous cation exchange membrane 14 between this anode plate electrode board 13 and the galvanized substrate W, and the inside of the plating tub main part 11 is isolated in the anode plate room 15 and the cathode room 16. In the substrate plating equipment 10 which performs metal plating to this galvanized substrate W, while arranging perpendicularly the anode plate electrode board 13, the galvanized substrate W, and a diaphragm The plating liquid discharge mechanism which can discharge the plating liquid in the cathode room 16 at least is established, the

plating liquid of this cathode room is discharged after a plating end, and it enabled it to take out the galvanized substrate W from this cathode room 16.

[Translation done.]



10:基板めっき装置
11:めっき槽本体
13:陽極電極板
14:多孔質の中性隔膜又は陽イオン交換膜
15:陽極室
16:陰極室
17:多孔体補強板
20:オーバーフロー槽
21:めっき液タンク
25:陽極液タンク
32:泡防御材

本発明に係る基板めっき装置の構成

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1] While arranging the anode plate electrode board and the galvanized substrate of non-solubility face to face, arrange the diaphragm which consists of

a porous neutral diaphragm or a porous cation exchange membrane between this anode plate electrode board and a galvanized substrate, and the inside of a plating tub is isolated in an anode plate room and a cathode room. In the substrate plating equipment which performs metal plating to this galvanized substrate, while arranging perpendicularly the aforementioned anode plate electrode board, the aforementioned galvanized substrate, and the aforementioned diaphragm Substrate plating equipment characterized by constituting so that the plating liquid discharge mechanism which can discharge the plating liquid in the aforementioned cathode room at least may be established, the plating liquid of the aforementioned cathode room may be discharged after a plating end and a galvanized substrate can be taken out from this cathode room.
[Claim 2] The liquid of the anode plate room isolated by the aforementioned diaphragm even if it discharged the plating liquid of the aforementioned cathode room in substrate plating equipment according to claim 1 is substrate plating equipment characterized by being held at the circulation state or the liquid fullness state.
[Claim 3] It is substrate plating equipment characterized by for the aforementioned cathode room having been constituted by closed mold, having made the aforementioned anode plate room into the open sand mold by which the upper part was opened wide in substrate plating equipment according to claim 1 or 2, and considering as the composition which can overflow liquid.
[Claim 4] Substrate plating equipment characterized by preparing the back up plate of the porous body which does not serve as trouble at passage of liquid and the electrical and electric equipment at one side or both sides of the aforementioned diaphragm in a claim 1 or the substrate plating equipment of any one publication of three.
[Claim 5] Substrate plating equipment characterized by preparing the bubble defense material which prevents that the gas which occurs from this anode plate electrode board front face between the aforementioned anode plate electrode board and the aforementioned diaphragm adheres to this diaphragm front face or the aforementioned back up plate in a claim 1 or the substrate plating equipment of any one publication of four.

[Translation done.]

* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to the substrate plating equipment which performs metal plating, such as copper, to substrates, such as a semiconductor wafer, with electrolysis plating.
[0002]
[Description of the Prior Art] In the semiconductor manufacture process, it is used abundantly as the object for wiring or the ** with a film of a wafer like metal platers, such as copper plating. In the electrolysis plating equipment which performs such metal plating with electrolysis plating, when a soluble electrode (** Lynn copper electrode) is used for an anode plate electrode, in addition to periodical exchange of an anode plate electrode, management of a surface black film, the cure against particle, etc. pose a problem.
[0003] Then, if the anode plate electrode of the electrolysis plating equipment which performs copper plating is used as the non-solubility anode plate electrode which used the electrode material of non-solubility While there is an advantage that periodical exchange of an anode plate electrode becomes unnecessary, and existence of the particle near the galvanized substrate is suppressed While the additive in plating liquid decomposes on an anode plate front face, additives run short and the plating front face of a galvanized substrate will be in a coarse state, there is also a problem that a slime is generated by disassembly of an additive. Although what is necessary is to arrange a diaphragm between an anode plate electrode and a cathode electrode (galvanized substrate) so that an additive contacts and may not decompose into an anode plate electrode front face, and just to isolate the inside of a plating tub in an anode plate room and a cathode room by this diaphragm, in order to prevent this, it is necessary to make it secede from the oxygen gas which occurs on an anode plate electrode front face at an early stage so that it may not become plating with trouble.
[0004] Moreover, the galvanized substrate drawing-out mechanism for extracting the galvanized substrate after a plating processing end out of the plating liquid of a cathode room is needed. In case a galvanized substrate is drawn out out of plating liquid, in order for the drop of the plating liquid adhering to the front face to disperse and to make it not pollute the circumference, this galvanized substrate drawing-out mechanism becomes complicated. Especially, in a semiconductor manufacturing process, the metal plating equipment of ** the object for wiring or with a film is installed in a clean room in many cases, careful attention must be paid and a galvanized substrate drawing-out mechanism will also become complicated from the point of the pollution control of a clean room.
[0005]
[Problem(s) to be Solved by the Invention] this invention was made in view of the above-mentioned point, and can take out the galvanized substrate after a plating processing end from the state where there is no plating liquid, and the ejection of a galvanized substrate aims at offering easy substrate plating equipment.
[0006] Moreover, it aims at offering the substrate plating equipment which can form the uniform metal plating film of thickness from which the oxygen gas which

occurs on the anode plate electrode board front face which the additive in plating liquid prevents contacting and decomposing into an anode plate electrode board front face, and a plating front face prevents a bird clapper coarsely with shortage of an additive, and serves as trouble of passage of the current at the time of electrolysis plating is promptly removable.
[0007]
[Means for Solving the Problem] In order to solve the above-mentioned technical problem invention according to claim 1 While arranging the anode plate electrode board and the galvanized substrate of non-solubility face to face, arrange the diaphragm which consists of a porous neutral diaphragm or a porous cation exchange membrane between this anode plate electrode board and a galvanized substrate, and the inside of a plating tub is isolated in an anode plate room and a cathode room. In the substrate plating equipment which performs metal plating to this galvanized substrate, while arranging perpendicularly an anode plate electrode board, a galvanized substrate, and a diaphragm The plating liquid eccrisis mechanism which can discharge the plating liquid in a cathode room at least is established, the plating liquid of this cathode room is discharged after a plating end, and it is characterized by constituting so that a galvanized substrate can be taken out from this cathode room.
[0008] By arranging perpendicularly an anode plate electrode board, a galvanized substrate, and a diaphragm as mentioned above, it generates on an anode plate electrode board front face, and the oxygen which serves as trouble at plating can be promptly discharged from an anode plate room. Moreover, the plating liquid eccrisis mechanism which can discharge the plating liquid in a cathode room is established, the plating liquid of this cathode room is discharged after a plating end, and since it constitutes so that a galvanized substrate can be taken out, the complicated galvanized substrate drawing-out mechanism for drawing out the galvanized substrate after a plating end from plating liquid like before is not needed.
[0009] Moreover, even if invention according to claim 2 discharges the plating liquid of a cathode room in substrate plating equipment according to claim 1, it is characterized by holding the liquid of the anode plate room isolated by the diaphragm at the circulation state or the liquid fullness state.
[0010] As mentioned above, since the liquid of an anode plate room is held at a circulation state or a liquid fullness state even if it discharges the plating liquid of a cathode room Although it becomes the component in the plating liquid which the diaphragm which consists of a porous neutral diaphragm or a porous cation exchange membrane by discharging the plating liquid of a cathode room was **(ed) by the dry gases, such as the atmosphere, and adhered to the cathode room side front face of a diaphragm, for example, the inclination for the crystal of a copper sulfate to be generated, and the inclination for a diaphragm to deteriorate by dryness Since the liquid of an anode plate room permeates this diaphragm slightly and a cathode side front face is in a damp or wet condition, generation of this crystal and transformation of a diaphragm can be prevented.
[0011] Moreover, it is characterized by considering as the composition which a cathode room is constituted for invention according to claim 3 by closed mold in

substrate plating equipment according to claim 1 or 2, makes an anode plate room the open sand mold by which the upper part was opened wide, and can overflow liquid.

[0012] As mentioned above, since it considered as the composition which makes an anode plate room an open sand mold, and can overflow liquid, the oxygen gas which occurred on the anode plate electrode board front face passes along the up opening section, and becomes easy to separate it from liquid.

[0013] Moreover, in substrate plating equipment according to claim 3, in order to separate with liquid the gas which occurs from an anode plate electrode board front face, it is characterized by preparing the overflow room in which the liquid which overflowed the anode plate room is held.

[0014] By preparing an overflow room as mentioned above, while the liquid overflowed from the anode plate room flows into this overflow room and piling up in this overflow room temporarily, liquid and oxygen gas are separated. And liquid flows out caudad by the gravity flow, and oxygen gas is discharged from the upper part.

[0015] Moreover, in a claim 1 or the substrate plating equipment of any one publication of three, it is characterized by preparing the back up plate of the porous body which does not serve as trouble at passage of liquid and the electrical and electric equipment at one side or both sides of a diaphragm.

[0016] As mentioned above, by having prepared the back up plate of the porous body used as trouble in passage of liquid and the electrical and electric equipment at one side or both sides of a diaphragm A cathode room is full of plating liquid, even if the fluid pressure of a cathode room becomes more than the fluid pressure of an anode plate room, a diaphragm projects (deformation), and does not turn on a cathode room side, and the interval of the position of a diaphragm, a galvanized substrate, and a diaphragm and an anode plate electrode board is maintained in parallel, and the uniform plating film of thickness can be formed in a galvanized substrate.

[0017] Moreover, invention according to claim 5 is characterized by preparing the bubble defense material which prevents that the gas which occurs from an anode plate electrode board front face between an anode plate electrode board and a diaphragm adheres to this diaphragm front face or a back up plate in a claim 1 or the substrate plating equipment of any one publication of four.

[0018] By preparing bubble defense material between an anode plate electrode board and a diaphragm, it is prevented that the foamy oxygen gas which occurs from the front face of the anode plate electrode board of non-solubility during plating processing adheres to a diaphragm or a back up plate. Consequently, electric field are disturbed by this bubble (the flow of current disturbed), there is no ****** and the plating film of uniform thickness can be formed in a galvanized substrate side.

[0019] Moreover, in a claim 1 or the substrate plating equipment of any one publication of five, with the liquid with which the liquid which circulates through an anode plate room consists of the basic liquid of the electrolytic-copper plating liquid except the additive, i.e., $CuSO_4$ and $5H_2O$, H_2SO_4, and Cl^-, an additive enters and is characterized by being liquid [****].

[0020] Moreover, it is characterized by the liquid which circulates through an anode plate room being H2SO4.
[0021] Since the liquid which contacts an anode plate electrode board by setting the liquid which circulates through an anode plate room as mentioned above to the basic liquid or H2SO4 of electrolytic-copper plating liquid which does not contain an additive is liquid which does not contain an additive, it is lost that an additive contacts an anode plate electrode board, and it decomposes and runs short of them of it, and it can form a surface smooth plating film in a galvanized substrate.
[0022]
[Embodiments of the Invention] Hereafter, the example of a gestalt of operation of this invention is explained based on a drawing. In addition, this example of an operation gestalt explains the substrate plating equipment which performs copper (Cu) plating to an example. Drawing 1 is drawing showing the composition of the substrate plating equipment concerning this invention. Substrate plating equipment 10 possesses the plating tub main part 11 and the side plate 12 so that it may illustrate. The plating tub main part 11 and a side plate 12 counter, and are arranged, and the crevice space A is formed in the field which counters the side plate 12 of the plating tub main part 11. Moreover, the soffit of a side plate 12 is a hinge mechanism (not shown), and can open now and close this crevice space A of the plating tub main part 11.
[0023] In the base of the crevice space of bottom body 11a of the plating tub main part 11, the anode plate electrode board 13 of non-solubility is arranged, and the field by the side of the plating tub main part 11 of a side plate 12 is equipped with the galvanized substrate W. By this, when the crevice space A of the plating tub main part 11 is closed by the side plate 12, the anode plate electrode board 13 and the galvanized substrate W will prepare a predetermined interval, and opposite arrangement will be carried out. Moreover, it was attached in the plating tub main part 11 so that a porous neutral diaphragm or a porous cation exchange membrane 14 might be located between the anode plate electrode board 13 and the galvanized substrate W, and the crevice space A of the plating tub main part 11 is isolated in the anode plate room 15 and the cathode room 16 by the neutral diaphragm or cation exchange membrane 14 of this porosity.
[0024] Moreover, both sides or one side (drawing field by the side of the anode plate room 15) of a porous neutral diaphragm or a cation exchange membrane 14 is reinforced with the porous-body back up plate 17. When this porous-body back up plate 17 discharges the plating liquid of the fluid pressure of the cathode room 16, or the cathode room 16 so that there may be no trouble in the flow of liquid and the electrical and electric equipment and it may explain in full detail behind with the resin board with which many punching holes were formed, it bears the fluid pressure of an anode plate room, and should just have the intensity which is not made to deform a porous neutral diaphragm or a porous cation exchange membrane 14.
[0025] The up header 18 and the lower header 19 are formed in the upper and lower sides of the plating tub main part 11, respectively, and opening 18a of the

up header 18 and opening 19a of a lower header are open for free passage in the cathode room 16, respectively. Moreover, the lower part of the anode plate room 15 is open for free passage to entrance 11b of the anode plate room liquid prepared in the plating tub main part 11, and the upper part is open for free passage to overflow mouth 11c of anode plate room liquid. Moreover, the flank of the plating tub main part 11 is adjoined at overflow mouth 11c, and the overflow room 20 is formed. Moreover, between the anode plate electrode board 13 of the anode plate room 15, the porous neutral diaphragm, or the cation exchange membrane 14, the bubble defense material 32 which prevents that the foamy oxygen (O2) gas which occurs on the front face of the anode plate electrode board 13 adheres to a neutral diaphragm or a porous cation exchange membrane 14, and the porous porous-body back up plate 17 on the occasion of plating processing is formed.

[0026] 21 is a plating liquid tank, and the plating liquid Q1 held in this plating liquid tank 21 is supplied to opening 19a of the lower header 19 through piping 23 with a pump 22, fills the cathode room 16 from this opening 19a, and returns to the plating liquid tank 21 through opening 18a of the up header 18, and piping 24 further. Moreover, 25 is an anolyte tank, and after overflowing it from overflow mouth 11c, flowing into the overflow room 20, after the anode plate room liquid Q2 held in this anolyte tank 25 is supplied to the anode plate room 15 through piping 27 with a pump 26 and fills this anode plate room 15, and piling up temporarily, it returns to the anolyte tank 25 through exhaust port 20a and piping 28.

[0027] Here, the cathode room 16 is constituted by closed mold and the anode plate room 15 serves as an open sand mold by which the upper part was wide opened by the atmosphere.

[0028] The annular packing 29 is formed in the periphery marginal part of the crevice space A of the plating tub main part 11, and by closing the crevice space A by the side plate 12, this packing 29 contacts the periphery front face of the galvanized substrate W, and makes the cathode room 16 a closed space. The external cathode terminal 30 is formed in the opposite side of the cathode room 16 of this packing 29, and where the crevice space A is closed by the side plate 12, while the nose of cam of the external cathode terminal 30 contacts the current carrying part of the galvanized substrate W and flowing through it electrically, it **** in plating liquid Q1 with this packing 29. The plating power supply 31 is connected between the external cathode terminal 30 and the anode plate electrode board 13.

[0029] In the substrate plating equipment 10 of the above-mentioned composition, while making the cathode room 16 full of plating liquid Q1 and making it circulate, it circulates making the anode plate room 15 full of anode plate room liquid Q2, and making it overflow, and a plating film is formed in the front face of the galvanized substrate W by energizing current between the galvanized substrates W which serve as the anode plate electrode board 13 of non-solubility, and cathode from the plating power supply 31. Here, the so-called basic liquid with which H2SO4 or CuSO4 and 5H2O and H2SO4, and Cl- were mixed as anode plate room liquid Q2 (an additive is not included) is used, using the mixed

solution of CuSO4 and 5H2O, H2SO4, Cl-, and an additive as plating liquid Q1.
[0030] Although oxygen (Q2) gas becomes foamy and occurs from the front face of the anode plate electrode board 13 on the occasion of this plating processing Since the neutral diaphragm or the cation exchange membrane 14, and the porous-body back up plate 17 of the anode plate electrode board 13 and porosity are arranged perpendicularly This oxygen gas goes up smoothly the inside of the anode plate room liquid Q2 in the anode plate room 15. While it is discharged at the same time this anode plate room liquid Q2 overflows from overflow mouth 11c and flows into the overflow room 20, and this anode plate room liquid Q2 is piling up temporarily, it dissociates and oxygen gas is emitted to the oxygen gas exhaust port 20b shell exterior. Moreover, since the bubble defense material 32 is formed between the neutral diaphragm of the anode plate electrode board 13 and porosity, or the cation exchange membrane 14, this foamy oxygen gas adheres to neither a porous neutral diaphragm or a porous cation exchange membrane 14, nor the porous-body back up plate 17.
[0031] Although there is a problem that the electric field between the anode plate electrode board 13 and the galvanized substrate W are disturbed (disturbing the flow of current), and the uniform plating film of thickness cannot be formed when oxygen gas exists foamy in anode plate room liquid Q2, since the foamy oxygen gas which occurred as mentioned above here falls out and comes out outside quickly out of anode plate room liquid Q2, the plating film of uniform thickness can be formed on the field of the galvanized substrate W.
[0032] Moreover, since the basic liquid (CuSO4 and 5H2O, H2SO4, Cl-) or H2SO4 of plating liquid Q1 which does not contain an additive as mentioned above is used for the anode plate room liquid Q2 which flows the anode plate room 15 Without add-in material's contacting and decomposing into the anode plate electrode board 13, and generating a slime, the additive in plating liquid Q1 is not insufficient with decomposition, and a surface coarse plating film is not necessarily formed in the galvanized substrate W. Moreover, since conductivity is high and H2SO4 is reserved in the liquid feeder which attaches to plating equipment as an object for supply of liquid, without affecting plating, it is easy to use the solution of H2SO4 for anode plate room liquid Q2.
[0033] As mentioned above, since the anode plate room 15 is the open sand mold by which the upper part was opened wide, since the cathode room 16 is closed mold, a fluid pressure becomes high from the fluid pressure of the anode plate room 15 somewhat by **** resistance of plating liquid Q1 to the fluid pressure in this anode plate room 15 not becoming high. Then, unless the porous-body back up plate 17 is formed, the neutral diaphragm or cation exchange membrane 14 of thin porosity of thickness serves as a configuration which was pushed on the fluid pressure of the cathode room 16, was pushed on the anode plate room 15 side, and curved, and does not become uniform [the interval between the neutral diaphragm of this porosity or a cation exchange membrane 14, and the galvanized substrate W]. Consequently, there is a problem that the uniform plating film of thickness is not formed on the galvanized substrate W.
[0034] Since this cause has the equal surface potential of a porous neutral

diaphragm or a cation exchange membrane 14, it is thought that it is because the part from which the interval between a porous neutral diaphragm or a cation exchange membrane 14, and the galvanized substrate W does not become uniform, and its electric field do not become uniform, either. Here, since the porous-body back up plate 17 is formed and the interval between the galvanized substrates W becomes always uniform, without a porous neutral diaphragm or a porous cation exchange membrane 14 deforming, the uniform plating film of thickness can be formed on the galvanized substrate W.

[0035] When plating processing is completed and it takes out from the cathode room 16 of the galvanized substrate W, the plating liquid Q1 of the cathode room 16 is returned to the plating liquid tank 21 through piping 23, it is in the state which discharged plating liquid Q1 from the cathode room 16, and the galvanized substrate W is taken out. Unlike sampling the galvanized substrate W, the drawing of the galvanized substrate W becomes very easy out of plating liquid Q1 by this (for example, it can take up easily by the robot hand), and the sampling mechanism of the galvanized substrate W of complicated composition is not needed.

[0036] Furthermore, a porous neutral diaphragm or a porous cation exchange membrane 14 will be **(ed) by the atmosphere by discharging plating liquid Q1 from the cathode room 16. Although the problem of membraneous quality changing when the crystal of CuSO4 of plating liquid Q1 is generated or a porous neutral diaphragm or a porous cation exchange membrane 14 dries will arise if a porous neutral diaphragm or a porous cation exchange membrane 14 is **(ed) by the atmosphere Here, since the anode plate room 15 is full of anode plate room liquid Q2, and slight anode plate room liquid Q2 permeates a porous neutral diaphragm or a porous cation exchange membrane 14 and makes the front face by the side of the cathode 15 the damp or wet condition, generation or a membraneous change of the crystal of such CuSO4 do not take place.

[0037] In addition, although the above-mentioned example of an operation gestalt explained the substrate plating equipment which performs Cu plating to the example, this invention is not limited to Cu plating and can be used for other washes.

[0038]

[Effect of the Invention] As explained above, according to invention given in each claim, the following outstanding effects are acquired.

[0039] While being able to make the plating generated on an anode plate electrode board front face by arranging perpendicularly an anode plate electrode board, a galvanized substrate, and a diaphragm discharge the foamy oxygen gas used as trouble from an anode plate room promptly according to invention according to claim 1 Since it constitutes so that the plating liquid eccrisis mechanism which can discharge the plating liquid in a cathode room may be established, the plating liquid of this cathode room may be discharged after a plating end and a galvanized substrate can be taken out The complicated galvanized substrate drawing-out mechanism for drawing out the galvanized substrate after a plating end from plating liquid like before is not needed.

[0040] Moreover, since according to invention according to claim 2 the liquid of

an anode plate room is held at a circulation state or a liquid fullness state even if it discharges the plating liquid of a cathode room Although it becomes the inclination for the diaphragm which consists of a porous neutral diaphragm or a porous cation exchange membrane by discharging the plating liquid of a cathode room to be **(ed) by the dry gases, such as the atmosphere, and for the component in plating liquid, for example, the crystal of a copper sulfate, to be generated by the cathode side front face of a diaphragm, and the inclination for a diaphragm to deteriorate by dryness Since the liquid of an anode plate room permeates this diaphragm slightly and the cathode side front face is in a damp or wet condition, generation of this crystal and transformation of a diaphragm can be prevented.

[0041] Moreover, since it considered as the composition which makes an anode plate room an open sand mold, and can overflow liquid according to invention according to claim 3, the oxygen gas which occurred on the anode plate electrode board front face passes along the up opening section, and becomes easy to separate it from liquid.

[0042] Moreover, by having prepared the back up plate of the porous body used as trouble in passage of liquid and the electrical and electric equipment at one side or both sides of a diaphragm according to invention according to claim 4 A cathode room is full of plating liquid, even if the fluid pressure of a cathode room becomes more than the fluid pressure of an anode plate room, a diaphragm projects (deformation), and does not turn on an anode plate room side, and the interval of the position of a diaphragm, a galvanized substrate, and a diaphragm and an anode plate electrode board is maintained in parallel, and the uniform plating film of thickness is formed in a galvanized substrate.

[0043] Moreover, although a bubble is generated in liquid from the front face of the anode plate electrode board of non-solubility during plating processing by preparing bubble defense material between an anode plate electrode board and a diaphragm according to invention according to claim 5 It is prevented that this bubble adheres to a diaphragm or a back up plate, there is nothing for which electric field are disturbed by this bubble (the flow of current is disturbed), and the plating film of uniform thickness can be formed in a galvanized substrate side.

[Translation done.]

* NOTICES *

DESCRIPTION OF DRAWINGS

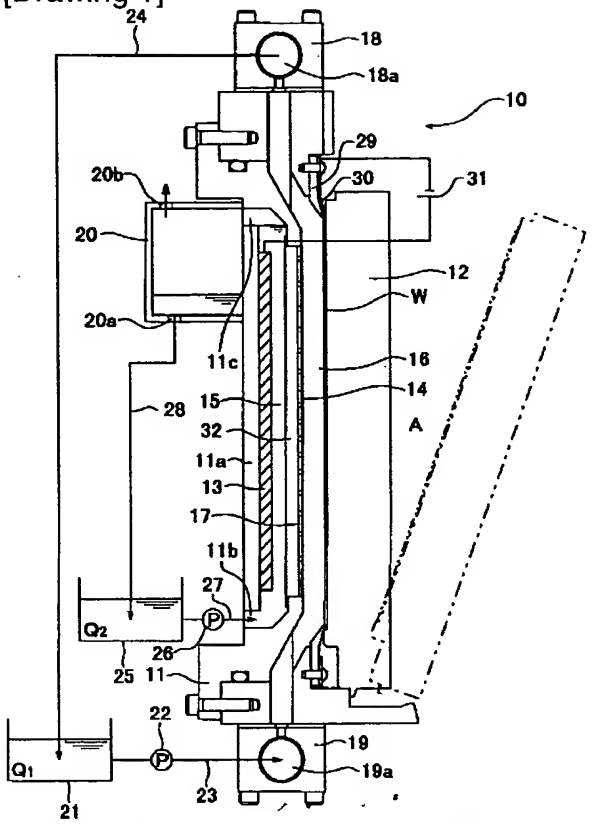
[Brief Description of the Drawings]
[Drawing 1] It is drawing showing the composition of the substrate plating equipment concerning this invention.
[Description of Notations]
10 Substrate Plating Equipment
11 Plating Tub Main Part
12 Side Plate
13 Anode Plate Electrode Board
14 Porous Neutral Diaphragm or Porous Cation Exchange Membrane
15 Anode Plate Room
16 Cathode Room
17 Porous-Body Back Up Plate
18 Up Header
19 Lower Header
20 Overflow Room
21 Plating Liquid Tank
22 Pump
23 Piping
24 Piping
25 Anolyte Tank
26 Pump
27 Piping
28 Piping
29 Packing
30 External Cathode Terminal
31 Plating Power Supply
32 Bubble Defense Material

[Translation done.]

* NOTICES *

DRAWINGS

[Drawing 1]



10:基板めっき装置
11:めっき槽本体
13:陽極電極板
14:多孔質の中性隔膜又は陽イオン交換膜
15:陽極室
16:陰極室
17:多孔体補強板
20:オーバーフロー室
21:めっき液タンク
25:陽極液タンク
32:泡防御材

本発明に係る基板めっき装置の構成

[Translation done.]